

PTO FORM 1449

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Applicant: COX III et al.
Filing Date: July 2, 2001
Group Art Unit 1631
Examiner: J.BRUSCA

U.S. PATENTS

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	A-5	5,223,409	June 29, 1993	Ladner et al.			
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Date: 21 August 2003

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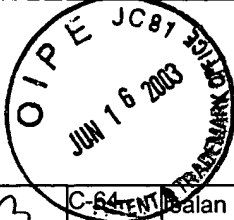
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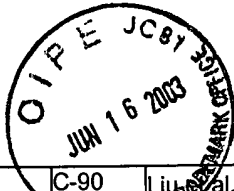
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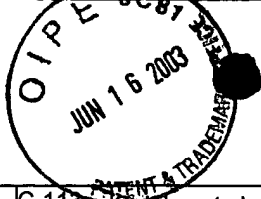
Examiner: J.K. BrunerDate: 21 August 2003

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In the Application of G.N. COX III et al.,

Serial No.: 09/897,844

Art Unit: 1631

Filed: July 2, 2001

Examiner: Unassigned

Title: REGULATION OF ENDOGENOUS GENE EXPRESSION IN CELLS USING ZINC FINGER PROTEINS

U.S. PATENT DOCUMENTS

Exam. Init.	Ref. Desig.	Document No.	Date	Name	Class	Sub Class	Filing Date
✓	AA-1	4,990,607	February 5, 19919	Katagiri et al.	_____	_____	
✓	AB-1	5,096,814	March 17, 1992	Aivasidis et al.	_____	_____	
✓	AC-1	5,096,815	March 17, 1992	Ladner et al.	_____	_____	
✓	AD-1	5,198,346	March 30, 1993	Ladner et al.	_____	_____	
✓	AE-1	5,223,409	June 29, 1993	Ladner et al.	_____	_____	
✓	AF-1	5,243,041	September 7, 1993	Fernandez-Pol	_____	_____	
✓	AG-1	5,302,519	April 12, 1994	Blackwood et al.	_____	_____	
✓	AH-1	5,324,638	June 28, 1994	Tao et al.	_____	_____	
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✓	AK-1	5,340,739	August 23, 1994	Stevens et al.	_____	_____	
✓	AL-1	5,348,864	September 20, 1994	Barbacid et al.	_____	_____	
✓	AM-1	5,350,840	September 27, 1994	Call et al.	_____	_____	
✓	AN-1	5,356,802	October 18, 1994	Chandrasegaran	_____	_____	
✓	AO-1	5,376,530	December 27, 1994	De The et al.	_____	_____	
✓	AP-1	5,403,484	April 4, 1995	Ladner et al.	_____	_____	

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<i>JB</i>	AQ-1	5,436,150	July 25, 1995	Chandrasegaran	<i> </i>	<i> </i>	
<i>JB</i>	AR-1	5,487,994	January 30, 1996	Chandrasegaran	<i> </i>	<i> </i>	
<i>JB</i>	AS-1	5,498,530	March 12, 1996	Schatz et al.	<i> </i>	<i> </i>	
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<i>JB</i>	AU-1	5,597,693	January 28, 1997	Evans et al.	<i> </i>	<i> </i>	
<i>JB</i>	AV-1	5,639,592	June 17, 1997	Abramson et al.	<i> </i>	<i> </i>	
<i>JB</i>	AW-1	5,674,738	October 7, 1997	Abramson et al.	<i> </i>	<i> </i>	
<i>JB</i>	AX1	5,702,914	December 30, 1997	Evans et al.	<i> </i>	<i> </i>	
<i>JB</i>	AY-1	5,789,538	August 4, 1998	Rebar et al.	<i> </i>	<i> </i>	
<i>JB</i>	AZ-1	5,792,640	August 11, 1998	Chandrasegaran	<i> </i>	<i> </i>	
<i>JB</i>	BA-1	5,869,618	February 9, 1999	Lippman et al.	<i> </i>	<i> </i>	
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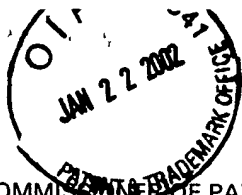
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FOREIGN PATENT DOCUMENTS

Exam. Init.	Ref. Desig.	Document No.	Publication Date	Country or Patent Office	Class	Sub Class	Translation YES NO	
JB	BJ-1	WO 95 19431	July 20, 1995	PCT	1	1		
	BK-1	WO 95/06110	February 29, 1996	PCT	1	1		
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JB	BY-1	WO 99/42474	August 26, 1999	PCT	/		
	BZ-1	WO 99/45132	September 10, 1999	PCT	/		
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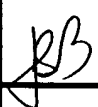

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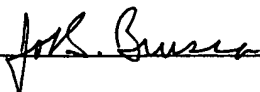
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Exam. Init.	Ref. Desig.	Description
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	CR-1	Blaese et al., "Vectors in Cancer Therapy: How Will They Deliver?," <i>Cancer Gene Therapy</i> <u>2</u> (4):291-297 (1995)
	CS-1	Caponigro et al., "Transdominant Genetic Analysis of a Growth Control Pathway," <i>PNAS</i> <u>95</u> :7508-7513 (1998)
	CT-1	Celenza et al., "A Yeast Gene That Is Essential for Release from Glucose Repression Encodes a Protein Kinase," <i>Science</i> <u>233</u> :1175-1180 (1986)
	CU-1	Cheng et al., "Identification of Potential Target Genes for Adrlp through Characterization of Essential Nucleotides in UASI," <i>J. Mol. Cellular Biol.</i> <u>14</u> (6):3842-3852 (1994)

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Examiner: Unassigned

Title: REGULATION OF ENDOGENOUS GENE EXPRESSION IN CELLS USING ZINC FINGER PROTEINS

Exam. Init.	Ref. Desig.	Description
	CV-1	Cheng et al., "A Single Amino Acid Substitution in Zinc Finger 2 of Adrlp Changes its Binding Specificity at two Positions in UAS1," <i>J. Mol. Biol.</i> <u>251</u> :1-8 (1995)
	CW-1	Choo et al., "A Role in DNA-Binding for the Linker Sequences of the First Three Zinc Fingers of TFIIIA <i>Nuc. Acids Res.</i> <u>21</u> (15):3341-3346 (1995)
	CX-1	Choo et al., "Promoter-Specific Activation of Gene Expression Directed By Bacteriophage-Selected Zinc Fingers," <i>J. Mol. Biol.</i> <u>273</u> :525-532 (1997)
	CY-1	Choo et al., "Designing DNA-Binding Proteins on the Surface of Filamentous Phage," <i>Curr. Opin. Biotechnology</i> <u>6</u> :431-436 (1995);
	CZ-1	Choo, Y., "Recognition of DNA Methylation by Zinc Fingers," <i>Nature Struct Biol.</i> <u>5</u> (4):264-365 (1998)
	DA-1	Choo et al., "All Wrapped Up," <i>Nature Structural Biology</i> <u>5</u> (4):253-255 (1998)
	DB-1	Choo, Y., "End Effects in DNA Recognition Code," <i>Nuc. Acids. Res.</i> <u>26</u> (2):554-557 (1998)
	DC-1	Choo et al., Physical Basis of Protein-DNA Recognition Code," <i>Curr. Opin. Struct. Biol.</i> <u>7</u> (1):117-125 (1997)
	DD-1	Choo et al., "In Vivo Expression by a Site-Specific DNA-Binding Protein Designed Against an Oncogenic Sequence," <i>Nature</i> <u>372</u> :642-645 (1994)
	DE-1	Choo et al., "Selection of DNA Binding Sites for Zinc Fingers Using Rationally Randomized DNA Reveals Coded Interactions," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>91</u> :11168-11172 (1994)
	DF-1	Choo et al., "Toward a Code for the Interactions of Zinc Fingers With DNA: Selection of Randomized Fingers Displayed on Phage," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>91</u> :11163-11167 (1994)
	DG-1	Clark et al., "Zinc Fingers in <i>Caenorhabditis elegans</i> : Finding Families and Probing Pathways," <i>Science</i> <u>282</u> :2018-2022 (1998)

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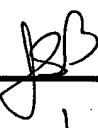

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	DH-1	Corbi et al., "Synthesis of a New Zinc Finger Peptide: Comparison of Its "Cod" Deduced and CASTing Derived Binding Sites," <i>FEBS Letters</i> <u>417</u> :71-74 (1997)
	DI-1	Crozatier et al., "Single Amino Acid Exchanges in Separate Domains of the Drosophila Serendipity δ Zinc Finger Protein Cause Embryonic and Sex Biased Lethality," <i>Genetics</i> <u>131</u> :905-916 (1992)
	DJ-1	Debs et al., Regulation of Gene Expression in Vivo by Liposome-Mediated Delivery of a Purified Transcription Factor," <i>J. Biological Chemistry</i> <u>265</u> (18):10189-10192 (1990)
	DK-1	Desjarlais et al., "Redesigning the DNA-Binding Specificity of a Zinc Finger Protein: A Data Base-Guided Approach," <i>Proteins: Structure, Function, and Genetics</i> <u>12</u> (2):101-104 (1992)
	DL-1	Desjarlais et al., "Redesigning the DNA-Binding Specificity of a Zinc Finger Protein: A Data Base-Guided Approach," <i>Proteins: Structure, Function, and Genetics</i> <u>13</u> (3):272 (1992)
	DM-1	Desjarlais, J. R. and Berg, J.M., "Length-Encoded Multiplex binding Site Determination: Application to Zinc Finger Proteins," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>91</u> :11099-11103 (1994)
	DN-1	Desjarlais, J. R. and Berg, J.M., "Use of a Zinc-Finger Consensus Sequence Framework and Specificity Rules to Design Specific DNA Binding Proteins," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>90</u> :2256-2260 (1993)
	DO-1	Desjarlais, J. R. and Berg, J.M., "Toward Rules Relating Zinc Finger Protein-Sequences and DNA Binding Preferences," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>90</u> :7345-4349 (1992)
	DP-1	Dibello et al., "The Drosophila <i>Broad-Complex</i> Encodes a Family of Related Proteins Containing Zinc Fingers," <i>Genetics</i> <u>129</u> :385-397 (1991)
	DQ-1	Elrod-Erickson et al., "High-Resolution Structures of Variant Zif268-DNA Complexes: Implications for Understanding Zinc Finger-DNA Recognition," <i>Structure</i> <u>6</u> (4):451-464 (1998)

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	DR-1	Elrod-Erickson et al., "Zif268 Protein-DNA Complex Refined at 1.6 Å: a Model System for Understanding Zinc Finger-DNA Interactions," <i>Structure</i> <u>4</u> (10):1171-1180 (1996)
	DS-1	Fairall et al., "The Crystal Structure of a Two Zinc-Finger Peptide Reveals an Extension to the Rules for Zinc-Finger /DNA Recognition," <i>Nature</i> <u>366</u> :483-487 (1993)
	DT-1	Frankel et al., "Fingering Too Many Proteins," <i>Cell</i> <u>53</u> :675 (1988)
	DU-1	Frankel et al., "Fingering Too Many Proteins," <i>Cell</i> <u>53</u> :675 (1988)
	DV-1	Friesen et al., "Phage Display of RNA Binding Zinc Fingers from Transcription Factor IIA*," <i>J. Biological Chem.</i> <u>272</u> (17):10994-10997 (1997)
	DW-1	Friesen et al., "Specific RNA Binding Proteins Constructed from Zinc Fingers," <i>Nature Structural Biology Biology</i> <u>5</u> (7):543-546 (1998)
	DX-1	Gilleman et al., "Altered DNA binding Specificity Mutants of EKLF and Spl Show that EKLF is an Activator of the b-Globin Locus Control Region <i>in vivo</i> ," <i>Genes and Development</i> <u>12</u> :2863-2873 (1998)
	DY-1	Gogos et al., "Recognition of Diverse Sequences by Class I Zinc Fingers: Asymmetries and Indirect Effects on Specificity in the Interaction Between CF2II and A + T-Rich Sequences Elements," <i>PNAS</i> <u>93</u> (5):2159-2164 (1996)
	DZ-1	Gossen et al., "Tight Control of Gene Expression in Mammalian Cells by Tetracycline-Responsive Promoter," <i>PNAS</i> <u>89</u> :5547-5551 (1992)
	EA-1	Greisman & Pabo, "A General Strategy for Selecting High-Affinity Zinc Finger Proteins for Diverse DNA Target Sites," <i>Science</i> <u>275</u> :657-661 (1997)
	EB-1	Hamilton et al., "Comparison of the DNA Binding Characteristics of the Related Zinc Finger Proteins WT1 and EGR1," <i>Biochemistry</i> <u>37</u> :2015-2058 (1998)
	EC-1	Hamilton et al., "High Affinity Binding Sites for the Wilms' Tumor Suppressor Protein WT1," <i>Nuc. Acids. Res.</i> <u>23</u> (2):277-284 (1995)

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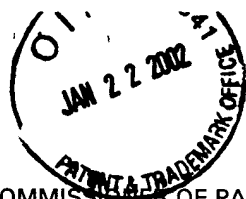
Exam. Init.	Ref. Desig.	Description
JB	ED-1	Hanas et al., "Internal Deletion Mutants of <i>Xenopus</i> Transcription Factor IIIA," <i>Nuc. Acids. Res.</i> <u>17</u> (23):9861-9870 (1989)
	EE-1	Hayes et al., "Locations of Contacts Between Individual Zinc Fingers <i>Xenopus laevis</i> Transcription Factor IIIA and the Internal Control Region of a 5S RNA Gene," <i>Biochemistry</i> <u>31</u> :11600-11605 (1992)
	EF-1	Heinzel et al., "A Complex containing N-CoR, MSin3 and Histone Deacetylase Medates Transcriptional Repression," <i>Nature</i> <u>387</u> :43-48 (1997)
	EG-1	Hirst et al., "Discrimination of DNA Response Elements for Thyroid Hormone and Estrogen is Dependent on Dimerization of Receptor DNA Binding Domains," <i>PNAS</i> <u>89</u> :5527-5531 (1992)
	EH-1	Hoffman et al., "Structures of DNA-Binding Mutant Zinc Finger Domains: Implications for DNA Binding," <i>Protein Science</i> <u>2</u> :951-965 (1993)
	EI-1	Imhof et al., "Transcriptional Regulation of the AP-Zalpha Promoter by BTEB-1 and AP-ZREP, a Novel WT-1/EGR-Related Zinc Finger Repressor," <i>Molecular and Cellular Biology</i> <u>19</u> (1):194-204 (1999)
	EJ-1	Isalan et al., "Synergy Between Adjacent Zinc Fingers in Sequence-Specific DNA Recognition," <i>PNAS</i> <u>94</u> (11):5617-5621 (1997)
	EK-1	Isalan et al., "Comprehensive DNA Recognition Through Concerted Interactions from Adjacent Zinc Fingers," <i>Biochemistry</i> <u>37</u> :12026-12033 (1998)
	EL-1	Jacobs, G.H., "Determination of the Base Recognition Positions of Zinc Fingers From Sequence Analysis," <i>EMBO J.</i> <u>11</u> (12):4507-4517 (1992)
	EM-1	Jamieson et al. "A Zinc Finger Directory for High-Affinity DNA Recognition," <i>PNAS</i> <u>93</u> :12834-12839 (1996)
✓	EN-1	Jamieson et al., "In Vitro Selection of Zinc Fingers with Altered DNA-Binding Specificity," <i>Biochemistry</i> <u>33</u> :5689-5695 (1994)

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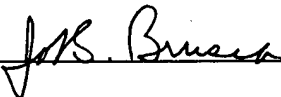
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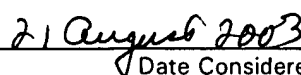
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Exam. Init.	Ref. Desig.	Description
	EO-1	Julian et al., "Replacement of His23 by Cys in a Zinc Finger of HIV-1NCp7 Led to a Change in 1H NMR-Derived 3D Structure and to a Loss of Biological Activity," <i>FEBS Letters</i> <u>331</u> (1,2):43-48 (1993)
	EP-1	Kamiuchi et al., "New Multi Zinc Finger Protein: Biosynthetic Design and Characteristics of DNA Recognition," <i>Nucleic Acids Symposium Series</i> <u>37</u> :153-154 (1997)
	EQ-1	Kang et al., "Zinc Finger Proteins as Designer Transcription Factors," <i>J. Biol. Chem.</i> <u>275</u> (12):8742-8748 (2000)
	ER-1	Kim et al., "Serine at Position 2 in the DNA Recognition Helix of a Cys2-His2 Zinc Finger Peptide is Not, in General, Responsible for Base Recognition," <i>J. Mol. Biol.</i> <u>252</u> :1-5 (1995)
	ES-1	Kim et al., "Site-Specific Cleavage of DNA-RNA Hybrids by Zinc Finger/ <i>FokI</i> Cleavage Domain Fusions," <i>Gene</i> <u>203</u> :43-49 (1997)
	ET-1	Kim et al., "A 2.2 Å Resolution Crystal Structure of a Designed Zinc Finger Protein Bound to DNA," <i>Nat. Struct. Biol.</i> <u>3</u> (11):940-945 (1996)
	EU-1	Kim et al., "Design of TATA Box-Binding Protein/Zinc Finger Fusions for Targeted Regulation of Gene Expression," <i>PNAS</i> <u>94</u> :3616-3620 (1997)
	EV-1	Kim et al., "Hybrid Restriction Enzymes: Zinc Finger Fusions <i>FokI</i> Cleavage Domain," <i>PNAS</i> <u>93</u> :1156-1160 (1996)
	EW-1	Kim, J.S. and Pabo, C.O., "Getting a Handhold on DNA: Design of Poly-Zinc finger Proteins with Femtomolar Dissociation Constants," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>95</u> :2812-2817 (1998)
	EX-1	Kim, J.S. and Pabo, C.O., "Transcriptional Repression by Zinc Finger Peptides," <i>The Journal of Biological Chemistry</i> <u>272</u> :29795-28000 (1997)
	EY-1	Kinzler et al., "The GLI Gene is Member of the Kruppel Family of Zinc Finger Proteins," <i>Nature</i> <u>332</u> :371-374 (1988)

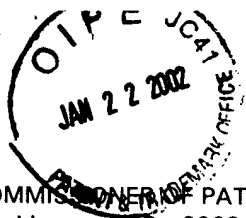
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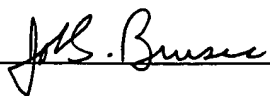
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	EZ-1	Kirwacki et al., "Sequence-Specific Recognition of DNA Zinc-Finger Peptides Derived From the Transcription Factor Sp1," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>89</u> :9859-9763 (1992)
	FA-1	Klug, A., "Gene Regulatory Proteins and Their Interaction with DNA," <i>Ann. NY Acad. Sci.</i> <u>758</u> :143-160 (1995)
	FB-1	Klug et al., "Protein Motifs 5: Zinc Fingers," <i>FASEB J.</i> <u>9</u> :597-604 (1995)
	FC-1	Klug, "Zinc Finger Peptides for the Regulation of Gene Expression," <i>J. Mol. Biol.</i> <u>293</u> :215-218 (1999)
	FD-1	Kothekar, "Computer Simulation of Zinc Finger Month from Cellular Nucleic Acid Binding Proteins and Their Interaction with Consensus DNA Sequences," <i>FEB Letters</i> <u>274</u> (1,2):217-222 (1990)
	FE-1	Kulda et al., "The Regulatory Gene <i>areA</i> Mediating Nitrogen Metabolite R in <i>Aspergillus nidulans</i> Mutations Affecting Specificity of Gene Activation Alter a Loop Residue of Putative Zinc Finger," <i>EMBO J.</i> <u>9</u> (5):1355-1364 (1990)
	FF-1	Laird-Offringa et al., "RNA-Binding Proteins Tamed," <i>Nat. Structural Biol.</i> <u>5</u> (8):665-668 (1998)
	FG-1	Liu et al., "Regulation of an Endogenous Locus Using a Panel of Designed Zinc Finger Proteins Targeted to Accessible Chromatin Regions: Activation of Vascular Endothelial Growth Factor A," <i>Journal of Biological Chemistry</i> <u>276</u> (14):11323-11334 (2001)
	FH-1	Liu et al., "Design of Polydactyl Zinc-Finger Proteins for Unique Addressing Within Complex Genomes," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>95</u> :5525-5530 (1997)
	FI-1	Liu et al., "Transcription Factor EGR-1 Suppresses the Growth and Transformation of Human HT-1080 Fibrosarcoma Cells by Induction of Transforming Growth Factor Beta 1," <i>Proceedings of the National Academy of Science, Washington</i> <u>93</u> (21):11831-11836 (1996)

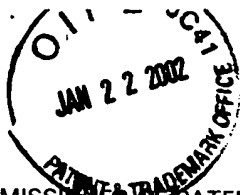
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	FJ-1	Mandel-Gutfreund et al., "Quantitative Parameters for Amino Acid-Base Interaction: Implication for Predication of Protein-DNA Binding Sites," <i>Nuc. Acids Res.</i> <u>26</u> (10):2306-2312 (1998)
	FK-1	Margolin et al., "Kruppel-Associated Boxes are Potent Transcriptional Repression Domains," <i>PNAS</i> <u>91</u> :4509-4513 (1994)
	FL-1	Mizushima et al., "pEF-BOS, a Powerful Mammalian Expression Vector," <i>Nuc. Acids. Res.</i> <u>18</u> (17):5322 (1990)
	FM-1	Nakagama et al., "Sequence and Structural Requirements for High-Affinity DNA Binding by the WT1 Gene Product," <i>Molecular and Cellular Biology</i> <u>15</u> (3):1489-1498 (1997)
	FN-1	Nardelli et al., "Zinc Finger-DNA Recognition: Analysis of Base Specificity by Site-Directed Mutagenesis," <i>Nucleic Acids Research</i> <u>20</u> (16):4137-4144 (1992)
	FO-1	Nardelli et al., "Base Sequence Discrimination by Zinc-Finger DNA-Binding Domians," <i>Nature</i> <u>349</u> :175-178 (1991)
	FP-1	Nekludova et al., "Distinctive DNA Conformation With Enlarged Major Groove is Found in Zn-Finger-DNA and Other Protein-DNA Complexes," <i>PNAS</i> <u>91</u> :6948-6952 (1994)
	FQ-1	Orkin et al., "Report and Recommendations of the Panel to Assess the NIH Investment in Research on Gene Therapy," (1995) www.nih.gov/news/panelrep.html
	FR-1	Pabo et al., "Systematic Analysis of Possible Hydrogen Bonds between Amino Acid Side Chains and B-form DNA," <i>J. Biomolecular Struct. Dynamic</i> <u>1</u> :1039-1049 (1983)
	FS-1	Pabo et al., "Protein-DNA Recognition," <i>Ann. Rev. Biochem.</i> <u>53</u> :293-321 (1984)
	FT-1	Pabo, C. O., "Transcription Factors: Structural Families and Principals of DNA Recognition," <i>Ann. Rev. Biochem.</i> <u>61</u> :1053-1095 (1992)
	FU-1	Pavletich et al., "Crystal Structure of a Five-Finger GLI-DNA Complex: New Perspectives on Zinc Fingers," <i>Science</i> , <u>261</u> :1701-1707 (1993)

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	FV-1	Pavletich et al., "Zinc Finger-DNA Recognition: Crystal Structure of a Zif268-DNA Complex at 2.1 Å," <i>Science</i> <u>252</u> :809-817 (1991)
	FW-1	Pengue et al., "Repression of Transcriptional Activity at a Distance by the Evolutionarily Conserved KRAB Domain Present in a Subfamily of Zinc Finger Proteins," <i>Nuc. Acids Res.</i> <u>22</u> (15):2908-2914 (1994)
	FX-1	Pengue et al., "Transcriptional Silencing of Human Immunodeficiency Virus Type I Long Terminal Repeat-Driven Gene Expression by the Kruppel-Associated Box Repressor Domain Targeted to the Transactivating Response Element," <i>J. Virology</i> <u>69</u> (10):6577-6580 (1995)
	FY-1	Pengue et al., "Kruppel-Associated Box-Mediated Repression of RNA Polymerase II Promoters is Influenced by the Arrangement of Basal Promoter Elements," <i>PNAS</i> <u>93</u> :1015-1020 (1996)
	FZ-1	Pomerantz et al., "Analysis of Homeodomain Function by Structure-Based Design of a Transcription Factor," <i>PNAS</i> <u>92</u> :9752-9756 (1995)
	GA-1	Pomerantz et al., "Structure-Based Design of Transcription Factors," <i>Science</i> <u>267</u> :93-96 (1995)
	GB-1	Pomerantz et al., "Structure-Based Design of a Dimeric Zinc Finger Protein," <i>Biochemistry</i> <u>37</u> (4):965-970 (1998)
	GC-1	Qian et al., "Two-Dimensional NMR Studies of the Zinc Finger Motif: Solution Structures and Dynamics of Mutant ZFY Domains Containing Aromatic Substitutions in the Hydrophobic Core," <i>Biochemistry</i> <u>31</u> :7463-7476 (1992)
	GD-1	Quigley et al., "Complete Androgen Insensitivity Due to Deletion of Exon C of the Androgen Receptor Gene Highlights the Functional Importance of the Second Zinc Finger of the Androgen Receptor <i>in Vivo</i> ," <i>Molecular Endocrinology</i> <u>6</u> (7):1103-1112 (1992)
	GE-1	Rauscher et al., "Binding of the Wilms' Tumor Locus Zinc Finger Protein to the EGR-1 Consensus Sequence," <i>Science</i> <u>250</u> :1259-1262 (1990)

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In the Application of G.N. COX III et al.,

Serial No.: 09/897,844

Art Unit: 1631

Filed: July 2, 2001

Examiner: Unassigned

Title: REGULATION OF ENDOGENOUS GENE EXPRESSION IN CELLS USING ZINC FINGER PROTEINS

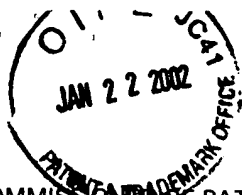
Exam. Init.	Ref. Desig.	Description
JEB	GF-1	Ray et al., "Repressor to Activator Switch by Mutations in the First Zn Finger of the Glucocorticoid Receptor: Is Direct DNA Binding Necessary?," <i>PNAS</i> <u>88</u> :7086-7090 (1991)
	GG-1	Rebar et al., "Phage Display Methods for Selecting Zinc Finger Proteins with Novel DNA-Binding Specificities," <i>Methods in Enzymology</i> <u>267</u> :129-149 (1996)
	GH-1	Rebar et al., "Zinc Finger Phage: Affinity Selection of Fingers With New DNA-Binding Specificities," <i>Science</i> <u>263</u> :671-673 (1994)
	GI-1	Reith et al., "Cloning of the Major Histocompatibility Complex Class II Promoter Binding Protein Affected in a Hereditary Defect in Class II Gene Regulation," <i>PNAS</i> <u>86</u> :4200-4204 (1989)
	GJ-1	Rhodes et al., "Zinc Fingers: They Play a Key Part in Regulating the Activity of Genes in Many Species, From Yeast to Humans. Fewer Than 10 Years Ago No One Knew They Existed." <i>Scientific American</i> <u>268</u> :56-65 (1993)
	GK-1	Rice et al., "Inhibitors of HIV Nucleocapsid Protein Zinc Fingers as Candidates for the Treatment of AIDS," <i>Science</i> . <u>270</u> :1194-1197 (1995)
	GL-1	Rivera et al., "A Humanized System for Pharmacologic Control of Gene Expression," <i>Nature Medicine</i> <u>2</u> (9):1028-1032 (1996)
	GM-1	Rollins et al., "'Role of TFIIIA Zinc Fingers <i>In vivo</i> : Analysis of Single-Finger Function in Developing <i>Xenopus</i> Embryos," <i>Molecular Cellular Biology</i> <u>13</u> (8):4776-4783 (1993)
	GN-1	Saleh et al., "A Novel Zinc Finger Gene on Human Chromosome 1 qter That is Alternatively Spliced in Human Tissues and Cell Lines," <i>American Journal of Human Genetics</i> <u>52</u> :192-203 (1993)
	GO-1	Shi et al., "Specific DNA-RNA Hybrid Binding by Zinc Finger Proteins," <i>Science</i> <u>268</u> :282-284 (1995)
	GP-1	Shi et al., "DNA Unwinding Induced by Zinc Finger Protein Binding," <i>Biochemistry</i> <u>35</u> :3845-3848 (1996)

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In the Application of G.N. COX III et al.,

Serial No.: 09/897,844

Art Unit: 1631

Filed: July 2, 2001

Examiner: Unassigned

Title: REGULATION OF ENDOGENOUS GENE EXPRESSION IN CELLS USING ZINC FINGER PROTEINS

Exam. Init.	Ref. Desig.	Description
JB	GQ-1	Shi et al., "A Direct Comparison of the Properties of Natural and Designed Finger Proteins," <i>Chem. & Biol.</i> <u>2</u> (2):83-89 (1995)
	GR-1	Singh et al., "Molecular Cloning of an Enhancer Binding Protein: Isolation by Screening of an Expression Library with a Recognition Site DNA," <i>Cell</i> <u>52</u> :415-423 (1988)
	GS-1	Skerka et al., "Coordinate Expression and Distinct DNA-Binding Characteristics of the Four EGR-Zinc Finger Proteins in Jurkat T Lymphocytes," <i>Immunobiology</i> <u>198</u> :179-191 (1997)
	GT-1	South et al., "The Nucleocapsid Protein Isolated from HIV-1 Particles Binds Zinc and Forms Retroviral-Type Zinc Fingers," <i>Biochemistry</i> <u>29</u> :7786-7789 (1990)
	GU-1	Spengler et al., "Regulation of Apoptosis and Cell Cycle Arrest by ZC1, A Novel Zinc finger Protein Expressed in the Pituitary Gland and the Brain," <i>EMBO Journal</i> <u>6</u> B, Oxford University Press, Surrey <u>16</u> (10):2814-2825 (1997)
	GV-1	Suzuki et al., "Stereochemical Basis of DNA Recognition by Zn Fingers," <i>Nuc. Acids Res.</i> <u>22</u> (16):3397-3405 (1994)
	GW-1	Suzuki et al. "DNA Recognition Code of Transcription Factors in the Helix-turn-Helix, Probe Helix, Hormone Receptor, and Zinc Finger Families," <i>PNAS</i> <u>91</u> :12357-12361 (1994)
	GX-1	Swimoff et al., "DNA-Binding Specificity of NGFI-A and Related Zinc Finger Transcription Factors," <i>Mol. Cell. Biol.</i> <u>15</u> (4):2275-2287 (1995)
	GY-1	Taylor et al., "Designing Zinc-Finger ADRI Mutants with Altered Specificity of DNA Binding to T in UAS1 Sequences," <i>Biochemistry</i> <u>34</u> :3222-3230 (1995)
	GZ-1	Thiesen et al., "Determination of DNA Binding Specificities of Mutated Zinc Finger Domains," <i>FEBS Letters</i> <u>283</u> (1):23-26 (1991)
	HA-1	Thiesen et al., "Amino Acid Substitutions in the SP1 Zinc Finger Domain Alter the DNA Binding Affinity to Cognate SP1 Target Site," <i>Biochem. Biophys. Res. Communications</i> <u>175</u> (1):333-338 (1991)

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In the Application of G.N. COX III et al.,

Serial No.: 09/897,844

Art Unit: 1631

Filed: July 2, 2001

Examiner: Unassigned

Title: REGULATION OF ENDOGENOUS GENE EXPRESSION IN CELLS USING ZINC FINGER PROTEINS

Exam. Init.	Ref. Desig.	Description
JB	HB-1	Thiesen, H. J., "From Repression Domains to Designer Zinc Finger Proteins: A Novel Strategy for Intracellular Immunization Against HIV," <i>Gene Expression</i> <u>5</u> :229-243 (1996)
	HC-1	Thukral et al., "Localization of a Minimal Binding Domain and Activation Regions in Yeast Regulatory Protein ADRI1," <i>Molecular Cellular Biology</i> <u>9</u> (6):2360-2369 (1989)
	HD-1	Thukral et al., "Two Monomers of Yeast Transcription Factor ADR1 Bind a Paldromic Sequence Symmetrically to Activate <i>ADH2</i> Expression," <i>Molecular Cellular Biol.</i> <u>11</u> (3):1566-1577 (1991)
	HE-1	Thurkral et al., "Alanine Scanning Site-Directed Mutagenesis of the Zinc Fingers of Transcription Factor ADR1: Residues that Contact DNA and that Transactivate," <i>PNAS</i> <u>88</u> :9188-9192 (1999 1), + correction page
	HF-1	Thukral et al., "Mutations in the Zinc Fingers of ADR1 That Change the Specificity of DNA Binding and Transactivation," <i>Mol. Cell Biol.</i> <u>12</u> (6):2794-2792 (1992)
	HG-1	Vortkamp et al., "Identification of Optimized Target Sequences for the GL13 Zinc Finger Protein," <i>DNA Cell Biol.</i> <u>14</u> (7):629-634 (1995)
	HH-1	Wang et al., "Dimerization of Zinc Fingers Mediated by Peptides Evolved <i>In Vitro</i> From Random Sequences," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>96</u> :9568-9573 (1999)
	HI-1	Webster et al., "Conversion of the E1A Cys4 Zinc Finger to a Nonfunctional His2, Cys2 Zinc Finger by a Single Point Mutation," <i>PNAS</i> <u>88</u> :9989-9993 (1991)
	HJ-1	Whyatt et al., "The Two Zinc Finger-Like Domains of GATA-1 Have Different DNA Binding Specificities," <i>EMBO J.</i> <u>12</u> (13):4993-5005 (1993)
	HK-1	Wilson et al., " <i>In Vivo</i> Mutational Analysis of the NGFI-A Zinc Fingers," <i>J. Biol. Chem.</i> <u>267</u> (6):3718-3724 (1992)
	HL-1	Witzgall et al., The Kruppel-Associated Box-A (KRAB-A) Domain of Zinc Finger Proteins Mediates Transcriptional Repression" <i>PNAS</i> <u>91</u> :4514-4518 (1994)

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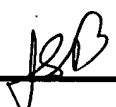

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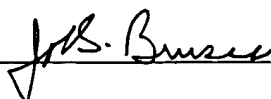
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Title: REGULATION OF ENDOGENOUS GENE EXPRESSION IN CELLS USING ZINC FINGER PROTEINS

Exam. Init.	Ref. Desig.	Description
	HM-1	Wright et al., "Expression of a Zinc Finger Gene in HTLV-1 and HTLV-II Transformed Cells," <i>Science</i> <u>248</u> :588-591 (1990)
	HN-1	Wolfe et al., "Analysis of Zinc Fingers Optimized <i>Via</i> Phage Display: Evaluating the Utility of a Recognition Code," <i>J. Mol. Biol.</i> <u>285</u> :1917-1934 (1999)
	HO-1	Wu et al., "Building Zinc Fingers by Selection: Toward a Therapeutic Application," <i>Proc. Natl. Acad. Sci. U.S.A.</i> <u>92</u> :344-348 (1995)
	HP-1	Yang et al., "Surface Plasmon Resonance Based Kinetic Studies of Zinf Finger-DNA Interaction," <i>J. Immunol. Methods</i> <u>183</u> :175-185 (1995)
	HQ-1	Yu et al., "A Hairpin Ribozyme Inhibits Expression of Diverse Strains of Human Immunodeficiency Virus Type 1," <i>PNAS</i> <u>90</u> :6340-6344 (1993)
	HR-1	Zhang et al., "Synthetic Zinc Finger Transcription Factor Action at an Endogenous Chromosomal Site. Activation of the Human Erythropoietin Gene," <i>Journal of Biological Chemistry</i> <u>275</u> (43):33850-33860 (2000)
	HS-1	Search of Swissprot. Data Base Performed ^{not a publication} 21 August 2000

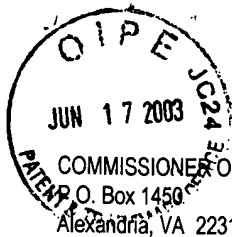
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In the Application of
G.N. Cox III *et al.*

Serial No.: 09/897,844

Art Unit: 1631

Filed: July 2, 2001

Examiner: John S. Brusca

Title: REGULATION OF ENDOGENOUS GENE EXPRESSION IN CELLS USING ZINC FINGER PROTEINS

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Exam. Init.	Ref. Desig.	Document No.	Date	Name	Class	Sub Class	Filing Date

FOREIGN PATENT DOCUMENTS

Exam. Init.	Ref. Desig.	Document No.	Publication Date	Country or Patent Office	Class	Sub Class	Translation YES NO

OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)

Exam. Init.	Ref. Desig.	Description
JB	D-1	Q. Dai <i>et al.</i> (2003) "A genetically engineered plasmid encoding a zinc finger VEGF-activating transcription factor induces angiogenesis in the rabbits with hind-limb ischemia." <i>Molecular Therapy</i> 7(5): S330-S331. Abstract No. 855
JB	D-2	B. Johnstone <i>et al.</i> (2003) "Induction of angiogenesis in rat skeletal muscle using a designed zinc finger protein transcriptional activator targeted to Vascular Endothelial Growth factor A (VEGF-A) <i>Molecular Therapy</i> 7(5): S235. Abstract No. 603
JB	D-3	X. Guan <i>et al.</i> (2002) "Heritable endogenous gene regulation in plants with designed polydactyl zinc finger transcription factors." <i>Proc. Natl. Acad. Sci. USA</i> 99(20): 13,296-13,301.
JB	D-4	E. Rebar <i>et al.</i> (2002) "Induction of angiogenesis in a mouse model using engineered transcription factors." <i>Nature Medicine</i> 8(12): 1427-1354.
JB	D-5	J-P. Sanchez <i>et al.</i> (2002) "Regulation of gene expression in <i>Arabidopsis thaliana</i> by artificial zinc finger chimeras." <i>Plant Cell Physiol.</i> 43(12): 1465-1472.

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